## REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow. After amending the claims as set forth above, claims 8-11 and 13-20 are now pending in this application.

Applicant wishes to thank the Examiner for the careful consideration given to the claims.

### Rejection of claim 18 under 35 U.S.C. 112, first paragraph

Claim 18 is rejected under 35 U.S.C. 112, first paragraph, because the original disclosure does not appear to support the feature that the movement of the valve mechanism rod is restricted within the width of the second passage. Claim 18 has been amended to clarify that the movement of the rod in the second passage varies from a zero protrusion amount to a maximum protrusion amount. Support for this amendment is provided in paragraph 0040 of the original specification. For at least this reason, favorable reconsideration of the rejection is respectfully requested.

### Rejection of claim 20 under 35 U.S.C. 112, second paragraph

Claim 20 is rejected under 35 U.S.C. 112, second paragraph, because of the terms "TPO" and "SBC." Claim 20 has been amended to change "TPO" and "SBC" to "thermoplastic olefin" or "styrenic block copolymers," respectfully. Paragraph 0022 of the original specification states that TPO and SBC are thermoplastic elastomers which can have a hardness of about D40-70 or about A80-90 hardness. One with ordinary skill in the art would understand that such a disclosure refers to thermoplastic olefin and styrenic block copolymers because such acronyms are well known in the art. The attached Appendices A and B show that TPO and SBC are acronyms used in the art to refer to these thermoplastic elastomers. For at least this reason, favorable reconsideration of the rejection is respectfully requested.

### Rejection of claims 8-11 and 18-20 based on Koganezawa and Inoac or Arima

Claims 8-11 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,489,409 ("Koganezawa") in view of JP 04-338523 ("Inoac") or U.S. Patent 5,486,325 ("Arima"). For at least the following reasons, this rejection is traversed.

Claim 8 (as amended) recites, among other things, a method of controlling an extrusion molding system which comprises a die having an opening including a first part with an unvariable shape and a second part with a variable shape, an extruder, a first gear pump, a branch part arranged upstream of the first and second parts which divides the die into a first passage connected with the first part of the opening for supplying the material and a second passage connected with the second part of the opening for supplying the material, and a valve mechanism. The method of claim 8 comprises the steps of conducting a first sequence control to change the shape of the second part of the opening; conducting a second sequence control to change a rotation speed of the first gear pump in synchronism with the change in the shape of the second part of the opening; and opening and closing the valve mechanism within a width of the second passage to control an amount of the material to be supplied to the first and second passages. As defined in claim 8, the extrusion molding system includes a die having an opening including a first opening part with an unvariable shape and a second opening part with a variable shape while the branch part divides the die into a first passage connected with the first opening part and a second passage connected with the second opening part. The branched part creates two passages and both of these passages leads to different areas of the same opening. Koganezawa, Inoac, Arima, or any combination thereof fails to teach or suggest all the features of claim 8.

The structure of Koganezawa does not include branched passages connected, respectively, to a variable portion and an unvariable portion of the same opening. The passage of Koganezawa for supplying the material has a wide section near the opening, which includes a variable shape portion and an unvariable shape portion. In other words, one passage is connected to both the variable portion and the unvariable portion. The quantity of material supplied from the extruder or the gear pump is varied in accordance with the variation of the sectional shape. (See Figs. 6-8 of Koganezawa.)

In general, the flow rate of the material is proportional to the cube of the sectional area of the fluid passage. It is difficult to attain a flow rate balance in the overall variable region only by a movable closing structure arranged to perform the proportional control of the sectional area of the outlet shape in accordance with the sectional shape of the product. This problem exists in the method and device of Koganezawa. For example, in a case in which the flow rate balance of the die is designed to provide the quantity of material necessary to

extrude a cross section formed when the closing structure (such as the slide cores 7 and 8) is opened, the flow rate is greater than the required flow rate at a portion of the unvariable shape portion when the closing structure is closed. Consequently, the shape of the product tends to be larger than desired. In a case in which the flow rate balance of the die is designed to provide the quantity of material necessary to extrude a cross section formed when the closing structure is in the closed state, the flow rate for the variable shape portion is less than the required flow rate when the closing structure is in the open state. Consequently, the shape of the product becomes smaller than desired.

Therefore, it is not possible to obtain a highly accurate sectional shape with the device and method of Koganezawa. Koganezawa does not teach or suggest a mechanism arranged to attain the appropriate balance for the flow rate in accordance with the variation of the sectional shape, by using a die having branched fluid passages for supplying the material to different portions of the same opening.[1] Furthermore, there is no suggestion or teaching in Koganezawa about this mechanism in the Koganezawa.

Inoac and/or Arima does not cure the deficiencies of Koganezawa. The branch passages of Arima and Inoac are not connected, respectively, to the variable portion and the unvariable portion of the <u>same</u> opening. The first passage is connected to the opening for supplying the material, and the second passage is connected to another opening for discharging excess material. For example, the device of Arima has a branch part that divides the supply passage $V_1$ into a passage that leads to one opening (the discharge pipe P) and another passage that leads to another distinct and different opening (the opening between the first and second cores $C_1$ and $C_2$. (Figs. 1-3 and column 2, lines 14-24 of Arima.) In the device of Inoac, a resin passage for the resin material forming the shape changing part branches into a passage 26 leading to a shape varying section outlet 24 and a passage 27 for excessive resin material leading to the outlet 29. (English Abstract and Figs. 1 and 7-9 of Inoac.)

In both Arima and Inoac, the quantity of the material supplied from the extruder is constant but the excess material is discharged from the discharge passage by moving the valve mechanism in accordance with the variation of the sectional shape of the product. In

[1] Indeed, the PTO correctly points out that Koganezawa does not teach or suggest a branch part. (Page 4 of the Office Action.)

Arima and Inoac, the excess material is discharged from the discharge passage, and accordingly the productivity is deteriorated (i.e., material is wasted).

Furthermore, the branched passages of Arima and Inoac are not connected, respectively, to the parts of the same opening to control the flow rate balance of the material supplied to the respective portions of the product. Moreover, there is no suggestion and teaching about this mechanism in Arima and Inoac. Accordingly, neither Arima nor Inoac cures the deficiencies of Koganezawa. Therefore, no combination of Koganezawa, Inoac, and/or Arima teaches or suggests all the features of claim 8.

Claims 9-11 and 18-20 depend from and contain all the features of claim 8, and are allowable for the same reasons as claim 8, without regard to the further patentable features contained therein.

For at least these reasons, favorable reconsideration of the rejection is respectfully requested.

## Conclusion

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date 1/16/2008

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**APPENDIX A**

ISO 9001:2000
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# Common Acronyms

A - C | D - G | H - O | P - R | S - Z

**SAE** - Society of Automotive Engineers

**SAN** - Styrene-acrylonitrile

**SB** - Styrene-butadiene

**SBR** - Styrene-butadiene rubber

**SEBS** - Styrene-ethylene butylene-styrene

**SF** - Structural foam

**SI** - Silicone

**SIC** - Silicone carbide

**SIG** - Special interest group

**SMA** - Styrene maleic anhydride

**SMC** - Sheet molding compound

**SMS** - Styrene/a-methylstyrene

**SP** - Saturated polyesters

**SPC** - Statistical process control

**SPE** - Society of Plastics Engineers, Inc.

**SPI** - Society of the Plastics Industry, Inc.

**SPPF** - Solid phase pressure forming

**SRIM** - Structural reaction injection molding

**SRP** - Styrene rubber plastics

**SS** - Single stage

**TAC** - Triallyl cyanurate

**TAHT** - 1,3,5-Triacryloyl hexahydrotriazine

**TCEF** - Trichloroethyl phosphate

**TCP4** - Tricresyl phosphate

**TDI** - Toluene diisocyanate

**TEEE** - Thermoplastic elastomer, ether-ether

**TEO** - Thermoplastic elastomer, olefinic

**TES** - Thermoplastic elastomer, styrenic

**TFA** - Fluoro-alkoxy-terpolymer

**TFB** - Perfluoro vinyldiene chloride terpolymer

**TFE** - Polytetra fluoroethylene

**THF** - Tetrahydrofuran

**TIO2** - Titanium dioxide $TiO^2$

**TMA** - Trimellitic anhydride

**TMC** - Thick molding compound

**TMDI** - Trimethyl hexamethylene diisocyanate

**TOF** - Trioctyl phosphate

**TPA** - Terephthalic acid

**TPE** - Thermoplastic elastomer

**TPO** - Thermoplastic polyolefin

**TPPE** - Thermoplastic polyester

**TPU** - Thermoplastic polyurethane

**TPV** - Thermoplastic vulcanizate

**TPX1** - 4-methylpentene-1 copolymer

**TSSC** - P-toluenesulfonyl semicarbazide

**UF** - Urea-formaldehyde

**UHM** - Ultra-high-modulus

**UHMW** - Ultra-high-molecular weight

**UHMWPE** - Ultra high molecular weight Polyethylene

**UL** - Underwriters Laboratories

**ULDPE** - Ultra low density polyethylene

**UP** - Unsaturated polyesters

**USASI** - U.S.A. Standards Institute (successor to ASA)

**USDA** - United States Department of Agriculture

**UV** - Ultraviolet

**VAC** - Vinyl acetate

**VAE** - Vinyl acetate-ethylene

**VC** - Vinyl chloride

**VCE** - Vinal chloride ethylene

**VCEMA** - Vinyl chloride ethylene methyl

**VCEVA** - Vinyl chloride ethylene vinyl acetate

**VCMA** - Vinyl chloride methyl acrylate

**VCOA** - Vinyl chloride octylacrylate

**VCVAC** - Vinyl chloride vinyl acetate

**VCVDL** - Vinyl chloride vinylidene chloride

**VDC** - Vinylidene chloride

**VF** - Vulcanized fiber

**VOC** - Volatile organic compounds

**WR** - Woven roving

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